Attorney Docket No. 2003P01969WOUS

UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	Juergen Eberle et al.
Application Number:	10/584,161
Filing Date:	03/29/2007
Group Art Unit:	3744
Examiner:	Jonathan Bryan Koagel
Title:	REFRIGERATING UNIT COMPRISING AN ULTRASOUND-WELDED SUCTION TUBE AND A THROTTLING TUBE

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Commissioner for Patents

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APPEAL BRIEF

Pursuant to 37 CFR 1.192, Appellants hereby file an appeal brief in the above-identified application. The requisite fee set forth in 37 CFR 1.17(f) was paid on September 2, 2010.

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(1) REAL PARTY IN INTEREST

The real party in interest is BSH Bosch und Siemens Hausgeräte GmbH of Munich, Germany.

(2) RELATED APPEALS AND INTERFERENCES

There are no appeals or interferences that will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) STATUS OF CLAIMS

Claims 1–6 and 11 are cancelled. Claims 7-10 and 12-28 are pending in the present application and have been finally rejected. The final rejections of claims 7-10 and 12-28 are being appealed. Claims 7 and 12 are independent.

(4) STATUS OF AMENDMENTS

In response to the Final Rejection dated June 3, 2010, Appellants filed an Amendment After Final Rejection traversing the rejections on July 22, 2010. Per the Advisory Action of August 9, 2010, this was entered for purposes of appeal.

(5) SUMMARY OF CLAIMED SUBJECT MATTER

A description of the subject matter recited in the pending claims that are argued separately is set forth below, along with an indication of the portions of the specification and drawings that provide support for these features.

7. A refrigerating unit comprising a suction tube (2; paragraph [0015]; Figure 1) and a throttling tube (1; paragraph [0015]; Figure 1) which runs at least over a part of its length inside the suction tube (2) and is guided out from the suction tube (2) to form a first outlet location (A; paragraph [0017]; Figure 1), wherein the throttling tube (1) and the suction tube (2) are joined to one another at a second location (B; paragraph [0019]; Figure 1) of the

suction tube (2) at which outer surfaces of the throttling tube (1) and the suction tube (2) are in contact (Figure 1), wherein the outer surfaces of the throttling tube and the suction tube are joined to one another at the second location (B) by ultrasound welding (paragraph [0019]).

8. The refrigerating unit according to claim 7, wherein the second location (B) is about 5 mm to 20 mm from the first location (A; paragraphs [0019] and [0009]).

12. A method for joining a suction tube (2) of a refrigerating unit to a throttling tube (1) comprising the following acts:

guiding the throttling tube (1) out from the inside of the suction at an outlet location (A) of the suction tube (2);

joining the suction tube (2) and the throttling tube (1) at the outlet location (A) by soldering (paragraph [0021]);

bringing in contact an outer surface of a portion of the throttling tube located outside the suction tube with an outer surface of the suction tube at a second location (B) of the suction tube;

joining the suction tube (2) and the throttling tube (1) at the second location (B);

joining the outer surfaces of the suction tube and the throttling tube to one another at the second location by ultrasound welding (Original claim 6; paragraphs [0020] plus [0027]; [0013], [0017]).

13. The refrigerating unit according to claim 7, wherein the second location is about 5 mm to 10 mm from the first location (paragraphs [0019] and [0009]).

14. The refrigerating unit according to claim 7, wherein the suction tube (2) and the throttling tube (1) are made of metal materials (paragraphs [0019] and [0008]).

15. The refrigerating unit according to claim 14, wherein the metal materials include copper or copper alloys (paragraphs [0019] and [0008]).

16. The refrigerating unit according to claim 7, wherein the suction tube and the throttling tube are fixed at the first outlet location by a soldering joint (paragraphs [0013] and [0017]).

19. The refrigerating unit according to claim 7, wherein the suction tube has a diameter of a few millimeters and the throttling tube has a diameter of fractions of a millimeter (paragraph [0016]).

22. The method according to claim 12, wherein the suction tube and the throttling tube are made of metal materials (paragraphs [0019] and [0008]).

23. The method according to claim 22, wherein the metal materials include copper or copper alloys (paragraphs [0019] and [0008]).

(6) GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

A) Whether claims 7-10, 12-14, 19, 20, 22, 26 and 27 are unpatentable under 35 U.S.C. §103(a) over Electrogerate FR 1,516,944 (FR '944) in view of Dobson et al. (U.S. Patent Publication No. 2002/0184911 A1).

B) Whether claims 14, 15, 22 and 23 are unpatentable under 35 U.S.C. §103(a) over FR '944 and Dobson et al. and further in view of Gelbard et al. (U.S. Patent No. 4,147,037).

C) Whether claims 16-18, 24 and 25 are unpatentable under 35 U.S.C. §103(a) over FR '944 and Dobson et al. and further in view of Bitter et al. (U.S. Patent No. 5,269,158).

D) Whether claims 21 and 28 are unpatentable under 35 U.S.C. §103(a) over FR '944 and Dobson et al. and further in view of Nocivelli (EP 0788860 A1) and Bitter et al.

(7) ARGUMENT

A) Claims 7-10, 12-14, 19, 20, 22, 26 and 27 are patentable under 35 U.S.C. §103(a) over Electrogerate FR 1,516,944 (FR '944) in view of Dobson et al. (U.S. Patent Publication No. 2002/0184911 A1).

Claims 7 and 12 - There is no motivation to combine the teachings of FR '944 and Dobson et al.

Claim 7 is directed to a refrigerating unit comprising a suction tube and a throttling tube which runs at least over a part of its length inside the suction tube and is guided out from the suction tube to form a first outlet location, wherein the throttling tube and the suction tube are joined to one another at a second location of the suction tube at which outer surfaces of the throttling tube and the suction tube are in contact, wherein the outer surfaces of the throttling tube and the suction tube are joined to one another at the second location by ultrasound welding. Claim 12 similarly recites a method that includes joining the outer surfaces of the suction tube and the throttling tube to one another at a second location of the suction tube at which outer surfaces of the throttling tube and the suction tube are in contact, wherein the outer surfaces of the throttling tube and the suction tube are joined to one another at the second location by ultrasonic welding.

The claimed structure and method is advantageous in that the heat required for ultrasonic welding is released at a short time and exclusively localized on the surfaces of the two tubes in contact with another. Other regions of the tubes are at most heated by heat flow from the region of contact. They thus remain substantially cooler than is possible by soldering, for example. Consequently, the structure of the material forming the suction tube and throttling tube, this usually being copper or a copper alloy, does not change decisefully. In addition, the mechanical strength properties of the material are thus not modified. In addition, this is a very cost-effective joining technique. Further, ultrasonic welding can be implemented in an automated fashion. See paragraph 8 of the original specification.

As acknowledged in the Office Action, FR '944 does not explicitly teach or suggest that the weld shown in reported section location 45 of the device depicted in Figure 11 as an ultrasonic weld as required as set forth in independent claims 7 and 12. In an effort to remedy this deficiency, the Office Action has cited to Dobson et al. as teaching the use of an ultrasonic welding at paragraph [0048] of Dobson et al.

However, Dobson et al. is directed toward an integrated U-tube and absorbent unit, e.g., for an automotive air conditioning system, per paragraph [0003] of Dobson et al.

Moreover, Dobson et al. is directed toward providing an integrated U-tube and absorbent unit wherein the absorbent unit is an integral and inseparable part of the U-tube. See paragraphs [0005] through [0016] of the Summary section of Dobson et al.

As FR '944 is directed toward compressors specifically adapted for use for domestic refrigerators, and because Dobson et al. is specifically directed toward a one piece U-tube-absorbent unit for an automobile air conditioning system, there appears to be no reason why one of ordinary skill in the art would have adopted the teachings of Dobson et al. which again is directed to an integrated U-tube and absorbent unit, not related to the present technology.

In the Advisory Action, the Examiner indicates that it would have been obvious "to use ultrasound welding in order to provide an adhering method that is much faster than conventional adhesives." However, Dobson et al. teaches the use of ultrasonic welding in conjunction with two plastic half pipe sections. There is no evidence that would suggest that application of Dobson's plastic ultrasonic welding technique would be predictably beneficial in FR '944's environment.

Moreover, the Examiner's allegation that "one of ordinary skill in the art would have known to use the technique of ultrasound welding" in general is insufficient to support a prima facie case of obviousness. The general knowledge of ultrasonic welding, in isolation, is insufficient to support a rejection of the claimed subject matter, which specifically relates to the use of an ultrasonic welding of outer surfaces of a suction tube and a throttling tube. There is no evidence that the use of an ultrasonic weld or two plastic pipe halves would have beneficial application to the suction and throttling tubes of FR '944 which are braised to one another.

There is no reason offered by the Examiner that one of ordinary skill in the refrigeration art (of the type having a suction tube and a throttling tube) would have known of the existence of Dobson et al. Thus, the Examiner has failed to identify the difference between the claimed invention and the relevant prior art. In addition, the Examiner has failed to resolve the level of a person having ordinary skill in the art (PHOSITA).

Claims 7 and 12 - Dobson et al. includes no suggestion to use ultrasonic welding to join outer surfaces of the throttling tube and the suction tube (claims 7 and 12).

Even if there is motivation to combine the teachings of FR '944 and Dobson et al., Dobson et al. does not teach the use of ultrasonic welding for joining the outer surfaces of the throttling tube and a suction tube as set forth in claims 7 and 12. Rather, the Examiner has relied on Figures 7-11 of Dobson et al. to reject the claims. However, this embodiment is directed toward the ultrasonic welding of two plastic pieces that make up a single U-shaped conduit. In particular, each of the plastic pieces form a half circle, such that when both half circles are joined to one another, they form a full circle and the inner passage of the conduit.

Accordingly, Dobson et al. does not teach or suggest the ultrasonic welding of two tubes, i.e., a suction tube and a throttling tube to one another, as set forth in claims 7 and 12. In addition, Dobson et al.'s halves 51 and 52 making up the U-tube 50 are injection molded and therefore have no application to the pipes of tubes which are involved in FR '944, in which the suction tube and the throttling tube are usually made of metal materials.

In response to this traversal, the Examiner points out that Dobson et al., in paragraph [0052], discloses a possibility that the U-tube may be made of metal. However, Dobson et al. does not teach the technique of using ultrasonic welding of metal. In particular, paragraph [0052] indicates that a metal U-tube can also be used if the covers, such as covers 40 and 40' are suitably bonded thereto, as by gluing or by any other suitable means. Specifically not mentioned in paragraph [0052] is the use of ultrasonic welding. By contrast, paragraph [0044] specifically indicates that covers 40 and 40' are preferably web-bonded polyester felt and are preferably heat fused along the outer edges to ridges 27 and 27', respectively, or they may be bonded to the ridges 27 and 27' by ultrasonic welding or vibration welding or any other suitable bonding means which may include, without limitation, any other type of fusion or the use of bonding cement or any other suitable means of attachment.

Stated differently, paragraph [0044] is specifically limited to the situation where the U-tube is made of plastic, and as such, ultrasonic welding is specifically mentioned.

Paragraph [0052] does not indicate that the U-tube is made of two metal pieces, and paragraph [0052] specifically does not mention that, assuming that the tube is made of two metal pieces, they are bonded to each other using ultrasonic welding. In addition, covers 40 and 40' are not said to be ultrasonically welded to such metal tube.

Moreover, even if the metal tube is ultrasonically welded, which it clearly is not disclosed as such, Dobson et al. still fails to teach or suggest the ultrasonic welding of a suction tube and a throttling tube, in particular, the ultrasonic welding of outer surfaces of the throttling tube and the suction tube. There is simply no reason or motivation why one of ordinary skill in the art would have taken Dobson et al.'s very specific disclosure of ultrasonically welding two plastic pipe halves to one another or covers 40, 40' thereto, for application of ultrasonic welding of outer surfaces of a throttling tube and a supply tube.

Even if Dobson et al. does teach ultrasonic welding of metal half-pipes, which it does not, it still does not teach ultrasonic welding of the outer surfaces of suction and throttling tubes, as claimed. Again, there is no teaching or suggestion that the use of ultrasonic welding in Dobson et al. would have a predictable beneficial result in the context of the throttling and suction tubes of FR '944, which are brazed.

Claim 12 - FR '944 and Dobson et al. do not teach the use of both a solder joint and an ultrasonic joint.

Independent claim 12 is a method for joining a suction tube of a refrigerating unit to a throttling tube. It includes joining the suction tube and the throttling tube at the outlet location by soldering and joining the outer surfaces of the suction tube and the throttling tube to one another at a second location by ultrasound welding. Similarly, independent claim 7 specifies that the suction tube and the throttling tube are joined to one another at a section location by ultrasonic welding. In addition, claim 16, discussed in part (C) below and dependent on claim 7, specifies that the suction tube and the throttling tube are fixed at the first outlet location by a soldering joint.

Neither FR '944 nor Dobson et al. has any suggestion to use two different types of weldings or joints to fasten the throttling tube to the suction tube, as effectively recited in claim 12, and claims 7 and 16 when considered together. In other words, FR '944 apparently teaches the uses of braised induction to join the throttling and supply tubes, whereas Dobson et al. uses ultrasonic welding to join its pipe halves and/or the covers to the pipe halves. There is no teaching or disclosure of using two different joining techniques at two different locations as specified in claims 12 and 16. Thus, Dobson et al., if adopted in FR '944, would suggest to use ultrasonic welding at both locations, not just one location. There is no teaching or suggestion to pick and choose Dobson et al.'s ultrasonic welding technique for one of the locations, but to maintain the brazing technique of FR '944 for the other location. Such amounts to impermissible hindsight. Moreover, one of ordinary skill in the art could not have predictably incorporated both the brazing technique as well as the ultrasonic technique for joining the same two pipes at two different locations. Dependent claims 17-28 include additional features relevant to the claimed throttling arrangement which make it even more apparent that Dobson et al.'s teachings have no relevance to FR '944.

Claims 8, 13, 19 and 26 - The Examiner has not established that the parameters of claims 8, 13, 19 and 26 are a result of effective variables.

Claim 8 specifies that the second location is about 5-20mm from the first location. Claim 13 specifies that the second location is about 5-10mm from the first location. Similarly, claims 19 and 26 specify that the diameter of the suction tube is a few millimeters and the diameter of the throttling tube is in the range of fractions of a millimeter. In the Office Action, pages 4, 7 and 8, the Examiner admits that none of the prior art teaches or suggests these parameters. However, the Examiner without justification, simply takes the stance that the claimed parameters are recognized as being result effective variables per MPEP 2144.05. In regard to claims 8 and 13, the Examiner has not established that the distance between the soldering joints or the relative diameters of the supply and throttling tubes were known to be result effective variables. Thus, it is not obvious to optimize them.

The fact that FR '944 teaches an unspecified distance between the two joints does not establish that the distance between the joints is a result effective variable. Moreover, in regard to claims 19 and 26, the Examiner has not established that the relative diameters of the supply and throttling tubes is a known, result effective variable, especially in conjunction with an ultrasonic weld between them.

Appellants respectfully request reversal of this rejection.

B) Claims 14, 15, 22 and 23 are patentable under 35 U.S.C. §103(a) over FR '944 and Dobson et al. and further in view of Gelbard et al. (U.S. Patent No. 4,147,037).

Claims 14, 15, 22 and 23

Claims 14, 15, 22 and 23 are patentable by virtue of their dependence on claims 7 or 12, and for the further features they recite. For example, claims 14 and 22 specify that the supply and throttling tubes are metal materials. Dobson et al. simply provides no teaching or disclosure to ultrasonically weld the outer surfaces of two metal material tubes to one another, and thus it is not obvious from Dobson et al. to ultrasonically weld the tubes shown in FR '944 or Gelbard et al.

Appellants respectfully request withdrawal of this rejection.

C) Claims 16-18, 24 and 25 are patentable under 35 U.S.C. §103(a) over FR '944 and Dobson et al. and further in view of Bitter et al. (U.S. Patent No. 5,269,158).

Claim 16 - FR '944 and Dobson et al. do not teach the use of both a solder joint and an ultrasonic joint (claim 16).

Independent claim 7 specifies that the suction tube and the throttling tube are joined to one another at a section location by ultrasonic welding. In addition, claim 16, dependent on claim 7, specifies that the suction tube and the throttling tube are fixed at the first outlet location by a soldering joint.

Neither FR '944 nor Dobson et al. has any suggestion to use two different types of weldings or joints to fasten the throttling tube to the suction tube, as effectively recited in claims 7 and 16 when considered together. In other words, FR '944 apparently teaches the uses of braised induction to join the throttling and supply tubes, whereas Dobson et al. uses ultrasonic welding to join its pipe halves and/or the covers to the pipe halves. There is no teaching or disclosure of using two different joining techniques at two different locations as specified in claim 16. Thus, Dobson et al., if adopted in FR '944, would suggest to use ultrasonic welding at both locations, not just one location. There is no teaching or suggestion to pick and choose Dobson et al.'s ultrasonic welding technique for one of the locations, but to maintain the brazing technique of FR '944 for the other location. Such amounts to impermissible hindsight. Moreover, one of ordinary skill in the art could not have predictably incorporated both the brazing technique as well as the ultrasonic technique for joining the same two pipes at two different locations.

Appellants respectfully request reversal of this rejection.

D) Claims 21 and 28 are patentable under 35 U.S.C. §103(a) over FR '944 and Dobson et al. and further in view of Nocivelli (EP 0788860 A1) and Bitter et al.

Claims 21 and 28 are patentable by virtue of their dependence on claims 7 or 12, in addition to the further features they recite.

Appellants respectfully request reversal of this rejection.

(8) CONCLUSION

In view of the foregoing discussion, Appellants respectfully request reversal of the Examiner's rejection.

Respectfully submitted,

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CLAIMS APPENDIX

1 - 6 (Canceled).

7. (Rejected) A refrigerating unit comprising a suction tube and a throttling tube which runs at least over a part of its length inside the suction tube and is guided out from the suction tube to form a first outlet location, wherein the throttling tube and the suction tube are joined to one another at a second location of the suction tube at which outer surfaces of the throttling tube and the suction tube are in contact, wherein the outer surfaces of the throttling tube and the suction tube are joined to one another at the second location by ultrasound welding.

8. (Rejected) The refrigerating unit according to claim 7, wherein the second location is about 5 mm to 20 mm from the first location.

9. (Rejected) The refrigerating unit according to claim 7, wherein the second location is located downstream from the outlet location with reference to the refrigerant flowing in the suction tube.

10. (Rejected) The refrigerating unit according to claim 7, wherein the outlet location is provided at a connecting tube on which both the suction tube and the throttling tube are fixed downstream in a liquid- and gastight manner.

11. (Canceled).

12. (Rejected) A method for joining a suction tube of a refrigerating unit to a throttling tube comprising the following acts:

guiding the throttling tube out from the inside of the suction at an outlet location of the suction tube;

joining the suction tube and the throttling tube at the outlet location by soldering;

bringing in contact an outer surface of a portion of the throttling tube located outside the suction tube with an outer surface of the suction tube at a second location of the suction tube;

joining the suction tube and the throttling tube at the second location;

joining the outer surfaces of the suction tube and the throttling tube to one another at the second location by ultrasound welding.

13. (Rejected) The refrigerating unit according to claim 7, wherein the second location is about 5 mm to 10 mm from the first location.

14. (Rejected) The refrigerating unit according to claim 7, wherein the suction tube and the throttling tube are made of metal materials.

15. (Rejected) The refrigerating unit according to claim 14, wherein the metal materials include copper or copper alloys.

16. (Rejected) The refrigerating unit according to claim 7, wherein the suction tube and the throttling tube are fixed at the first outlet location by a soldering joint.

17. (Rejected) The refrigerating unit according to claim 7, further comprising an evaporator having a refrigerant tube into which the throttling tube is inserted.

18. (Rejected) The refrigerating unit according to claim 17, further comprising a connecting section into which the refrigerant from the refrigerant tube may be discharged and through which the throttling tube is guided and positioned.

19. (Rejected) The refrigerating unit according to claim 7, wherein the suction tube has a diameter of a few millimeters and the throttling tube has a diameter of fractions of a millimeter.

20. (Rejected) The refrigerating unit according to claim 7, wherein each of the suction tube and the throttling tube has an interior diameter surface defining a passage for refrigerant, and an outer diameter surface which together define a wall thickness therebetween, the suction tube and throttling tube being aligned in side-by-side relation such that their longitudinal axes are substantially parallel whereby at least along a portion of the lengths thereof, the ultrasonic welding is located at said portion to weld the outer diameter surface of the throttling tube to the outer diameter surface of the suction tube.

21. (Rejected) The refrigerating unit according to claim 7, wherein the suction tube includes first and second portions, the first portion being inserted into the second portion to

define an overlapping portion, the overlapping portion between the first and second portions being joined by a first soldering joint and the suction tube being welded to the first and second portions throttling tube at a second soldering joint.

22. (Rejected) The method according to claim 12, wherein the suction tube and the throttling tube are made of metal materials.

23. (Rejected) The method according to claim 22, wherein the metal materials include copper or copper alloys.

24. (Rejected) The method according to claim 12, further comprising an evaporator having a refrigerant tube into which the throttling tube is inserted.

25. (Rejected) The method according to claim 24, further comprising a connecting section into which the refrigerant from the refrigerant tube may be discharged and through which the throttling tube is guided and positioned.

26. (Rejected) The method according to claim 12, wherein the suction tube has a diameter of a few millimeters and the throttling tube has a diameter of fractions of a millimeter.

27. (Rejected) The method according to claim 12, wherein each of the suction tube and the throttling tube has an interior diameter surface defining a passage for refrigerant, and an outer diameter surface which together define a wall thickness therebetween, the suction tube and throttling tube being aligned in side-by-side relation such that their longitudinal axes are substantially parallel whereby at least along a portion of the lengths thereof, the ultrasonic welding is located at said portion to weld the outer diameter surface of the throttling tube to the outer diameter surface of the suction tube.

28. (Rejected) The method according to claim 12, wherein the suction tube includes first and second portions, the first portion being inserted into the second portion to define an overlapping portion, the overlapping portion between the first and second portions being joined by a first soldering joint and the suction tube being welded to the first and second portions throttling joint at a second soldering joint.

EVIDENCE APPENDIX

None

RELATED APPEALS APPENDIX

None